

Nanostructure Characteristics of Cloned Teak Cepu and Cloned Teak Madiun Skim RIP 2013 UNHAS, No. Kontrak 746/UN4.20/PL.09/2013

(Faculty of Forestry, UNHAS, Indonesia) o. A.D. Yuniarti
(Faculty of Forestry, IPB, Indonesia) o Wahyudi, I, Siregar, I.Z.
(FORDA, Indonesia) o. Pari, G.

Outline

In the scope of the research object on nanostructure of cloned teak from two spacing were examined. We have investigated the dimension of cellulose crystallite (thickness and length), degree of crystallinity and microfibril angle from two plantation spacing (i.e. 3 x 3 m and 2 x 6 m). For evaluating all parameters was used Xrd with the radiation source is copper. Wood samples were used from cloned teak cepu and cloned teak Madiun cloned, East Java in Indonesia.

Keywords: cloned teak, cepu, madiun, spacing, nanostructure

Introduction

Teak (*Tectona grandis* L.F), especially cloned teak is a tree species that has been widely developed in plantation forest. It is important to know for wood quality (nanostructure) cause teak is a slow growing become fast growing. Variation in terms of wood qualities from cloned teak was widely observed, especiality of fast growing species. However, understanding the causes of the variation patterns of wood quality at the nano level is still lacking.

Experiment

The objective of research was to analyze nanostructure of cell wall from two cloned teak (Cepu and Madiun) at two different spacing (3 x 3 m and 2 x 6 m). At nano scale, X-ray Diffractometer (XRD) was used to measure nanostructure characteristics, i.e. MFA, length, thickness and degree of cellulose crystallites. The radiation source in the diffractometer was $\text{CuK}\alpha$ ($\lambda = 0.1541$ nm).

Result and Discussion

Results showed that nanostructure of cell wall from cloned teak was influenced by sources cloned and spacing. The characteristic nanostructure cloned teak Cepu and Madiun were showed in Table below :

Table Nanostructure Characteristic of Cloned Teak from Two Spacing Plantation

Spacing	Sources			Average
	Seed	Cepu	Madiun	
Microfibril Angle (°)				
3 x 3 m	18.67±1.86	20.84±3.21	23.45±6.07	21.71
2 x 6 m		20.71±3.94	22.90±2.99	21.44
Average		20.78	23.18	
Thickness Crystallinity (nm)				
3 x 3 m	2.86±0.13	3.30±0.20	3.31±0.18	3.30
2 x 6 m		3.26±0.10	3.16±0.38	3.23
Average		3.28	3.24	
Length Crystallinity (nm)				
3 x 3 m	13.58±4.26	18.80±3.96	19.15±7.11	18.92
2 x 6 m		17.87±8.94	24.44±8.94	20.06
Average		18.33	21.79	
Degree of Crystallinity (%)				
3 x 3 m	50.11±5.61	53.43±3.53	51.88±3.10	52.91
2 x 6 m		53.61±3.52	54.17±3.80	53.80
Average		53.52	53.02	

As shown in Table, characteristic nanostructure from cloned cepu was better than that of cloned madiun, particularly at the spacing of 2 m x 6 m. This spacing, therefore, is considered importantly for economic and wood quality cloned teak development.